

In the Claims

1. (Previously Presented) An electrical wire comprising:

at least one electrifiable conductor for delivering electrical power; and

first and second return conductors which are respectively formed on opposing sides of said at least one electrifiable conductor, such that said at least one electrifiable conductor is at least substantially entrapped by said first and second return conductors;

wherein a distance between said at least one electrifiable conductor and each of said first and second return conductors is no greater than approximately 0.030 inches.

2. (Original) The electrical wire according to claim 1, further comprising:

first and second insulating layers which are formed between said at least one electrifiable conductor and said first and second return conductors, respectively.

3. (Original) The electrical wire according to claim 1, wherein said at least one electrifiable conductor and said first and second return conductors comprise substantially flat conductive layers having a stacked arrangement.

4. (Cancelled)

5. (Original) The electrical wire according to claim 1, wherein said first and second return conductors contact each other along a longitudinal edge of said electrical wire, such that said electrifiable conductor is completely entrapped by said first and second return conductors.

6. (Original) The electrical wire according to claim 1, wherein said first and second return conductors are treated by at least one of a mechanical, chemical and thermal treatment to form a protective longitudinal edge of said electrical wire, said protective edge inhibiting a foreign object from penetrating said electrical wire and contacting said Electrifiable conductor without contacting one of said first and second return conductors.

7. (Original) The electrical wire according to claim 2, wherein said first and second insulating layers, contact each other along a longitudinal edge of said electrical wire.

8. (Original) The electrical wire according to claim 7, wherein said first and second insulating layers are treated by at least one of a mechanical, chemical and thermal treatment to form a protective longitudinal edge of said electrical wire, said protective edge inhibiting a foreign object from penetrating said electrical wire and contacting said at least one Electrifiable conductor.

9. (Original) The electrical wire according to claim 2, further comprising:
an outer insulating layer formed on said first and second return conductors.

10. (Previously Presented) An electrical wire comprising:

at least one electrifiable conductor for delivering electrical power;

first and second insulating layers formed on opposing sides of said at least one electrifiable conductor;

first and second return conductors formed on said first and second insulating layers, respectively, such that said at least one electrifiable conductor is at least substantially entrapped by said first and second return conductors;

third and fourth insulating layers formed on said first and second return conductors, respectively;

first and second grounding conductors formed on said third and fourth insulating layers, respectively; and

fifth and sixth insulating layers formed on said first and second grounding conductors, respectively;

wherein a distance between said at least one electrifiable conductor and each of said first and second return conductors is no greater than approximately 0.030 inches.

11. (Original) The electrical wire according to claim 10, wherein said first and second return conductors are treated by at least one of a mechanical, chemical and thermal treatment to form a protective longitudinal edge of said electrical wire, said protective edge inhibiting a foreign object from penetrating said electrical wire and contacting said Electrifiable conductor without contacting one of said first and second return conductors.

12. (Original) The electrical wire according to claim 10, wherein an area between said first and second return conductors forms a hot zone, said at least one electrifiable conductor being disposed within said hot zone.

13. (Original) The electrical wire according to claim 12, wherein said at least one Electrifiable conductor comprises a plurality of Electrifiable conductors which are formed in said hot zone and comprise a plurality of horizontal segments across a width of said wire and a plurality of vertical segments across a thickness of said wire.

14. (Original) The electrical wire according to claim 13, wherein at least one segment in said plurality of horizontal segments of said Electrifiable conductors is used to transmit a communication signal, and
wherein at least one segment in said plurality of horizontal segments of said Electrifiable conductors is used to supply one of AC and DC electrical power.

15. (Original) The electrical wire according to claim 14, wherein said communication signal comprises one of a voice communication signal and a data communication signal.

16. (Original) The electrical wire according to claim 10, wherein a capacitance formed between said at least one Electrifiable conductor and said first and second return conductors is given as $C=1.5 \cdot W \cdot L \cdot \epsilon / d$, where W is the width of the return and electrifiable conductors, L is the length of the return and electrifiable conductors, ϵ is the dielectric constant for the first and second insulating layers, and d is the distance between each of the return and electrifiable conductors.

17. (Original) The electrical wire according to claim 10, further comprising:
an adhesive for bonding adjacent insulation layers and conductors in said electrical wire.
18. (Original) The electrical wire according to claim 10, wherein an object penetrating an outer surface of said electrical wire contacts one of said first and second grounding conductors and one of said first and second return conductors, before contacting said at least one Electrifiable conductor.
19. (Original) The electrical wire according to claim 10, wherein said first and second grounding conductors inhibit power transmission signals and load-generated electrical noise from being emitted from said electrical wire.
20. (Original) The electrical wire according to claim 10, wherein said first and second return conductors and said first and second grounding conductors comprise a rate of heat dissipation which is greater than a rate of heat dissipation for an round conductor, for a given cross-sectional area.
21. (Original) The electrical wire according to claim 10, wherein said electrical wire comprises one of alternating current (AC) electrical wire and direct current (DC) electrical wire for supplying an electrical current having potential of greater than 0V.
22. (Original) The electrical wire according to claim 10, wherein said electrical wire comprises surface-mountable electrical wire.
23. (Original) The electrical wire according to claim 10, wherein said first and second return conductors each have a thickness T_G , and said first and second grounding conductors each have a thickness T_N , and said Electrifiable conductor has a thickness T_H , such that a ratio of thicknesses $R=(T_G+T_N)/T_H$ is at least 1.00.

24. (Previously Presented) An electrical wire comprising:
- at least one electrifiable conductor for delivering electrical power;
 - a first insulating layer formed around said at least one electrifiable conductor;
 - a return conductor formed around said first insulating layer, such that said at least one electrifiable conductor is at least substantially entrapped by said return conductor; and
 - a second insulating layer formed around said return conductor;
- wherein a distance between said at least one electrifiable conductor and said return conductor is no greater than approximately 0.030 inches.
25. (Original) The electrical wire according to claim 24, further comprising:
- a grounding conductor formed around said second insulating layer; and
 - a third insulating layer formed around said grounding conductor.
26. (Previously Presented) The electrical wire according to claim 24, wherein said at least one electrifiable conductor, said return conductor and said grounding conductor comprise one of substantially curvilinear-shaped cross-sectional geometries and substantially rectilinear cross-sectional geometries.
27. (Original) The electrical wire according to claim 24, wherein said electrifiable conductor, said return conductor and said grounding conductor are formed in substantially parallel planes.
28. (Original) The electrical wire according to claim 24, wherein said electrical wire comprises a substantially flat electrical wire having a total thickness of no more than about 0.050 inches.
29. (Original) The electrical wire according to claim 24 wherein said electrifiable conductor, said return conductor and said grounding conductor comprise substantially oval-shaped conductors.

30. (Previously Presented) A method of fabricating an electrical wire, comprising:
forming at least one electrifiable conductor for delivering electrical power; and
forming first and second return conductors on opposing sides of said at least one electrifiable conductor, such that said at least one electrifiable conductor is at least substantially entrapped by said return conductors;
wherein a distance between said at least one electrifiable conductor and each of said first and second return conductors is no greater than approximately 0.030 inches.
31. (Original) An electrical current delivery system comprising the electrical wire of claim 1.
32. (Original) An electrical signal transmission system comprising the electrical wire of claim 1.
33. (Previously Presented) The electrical wire according to claim 1, wherein each of said first and second return conductors substantially surround a periphery of said at least one electrifiable conductor.
34. (Previously Presented) The electrical wire according to claim 1, wherein said electrifiable conductor comprises a power delivery conductor for delivering electrical current to a load.
35. (Previously Presented) The electrical wire according to claim 34, wherein at least one of said return conductors comprises a conductor for carrying a current away from said load.
36. (Previously Presented) The electrical wire according to claim 1, wherein said electrical wire comprises AC electrical wire for delivering AC electrical power.
37. (Previously Presented) The electrical wire according to claim 1, wherein said electrical wire comprises one of 120V AC electrical wire and 240V AC electrical wire.

38. (Previously Presented) The electrical wire according to claim 1, wherein said at least one electrifiable conductor comprises a cross-sectional area which is substantially equal to a cross-sectional area of at least one of said first and second return conductors.

39. (Previously Presented) The electrical wire according to claim 1, wherein said electrifiable conductor comprises a thickness which is in a range from about 0.0004 inches to about 0.020 inches.

40. (Cancelled)

41. (Previously Presented) An electrical wire comprising:

at least one electrifiable conductor for delivering electrical power; and

first and second return conductors which are respectively formed on opposing sides of said at least one electrifiable conductor, such that said at least one electrifiable conductor is at least substantially entrapped by said first and second return conductors;

wherein a total thickness of the electrical wire is no more than approximately 0.050 inches.

42. (Previously Presented) An electrical wire comprising:

at least one electrifiable conductor for delivering electrical power;

first and second insulating layers formed on opposing sides of said at least one electrifiable conductor;

first and second return conductors formed on said first and second insulating layers, respectively, such that said at least one electrifiable conductor is at least substantially entrapped by said first and second return conductors;

third and fourth insulating layers formed on said first and second return conductors, respectively;

first and second grounding conductors formed on said third and fourth insulating layers, respectively; and

fifth and sixth insulating layers formed on said first and second grounding conductors, respectively;

wherein a total thickness of the electrical wire is no more than approximately 0.050 inches.

43. (New) The electrical wire according to claim 41, further comprising:

first and second insulating layers which are formed between said at least one electrifiable conductor and said first and second return conductors, respectively.

44. (New) The electrical wire according to claim 41, wherein said at least one electrifiable conductor and said first and second return conductors comprise substantially flat conductive layers having a stacked arrangement.

45. (New) The electrical wire according to claim 41, wherein said first and second return conductors contact each other along a longitudinal edge of said electrical wire, such that said electrifiable conductor is completely entrapped by said first and second return conductors.

46. (New) The electrical wire according to claim 41, wherein said first and second return conductors are treated by at least one of a mechanical, chemical and thermal treatment to form a protective longitudinal edge of said electrical wire, said protective edge inhibiting a foreign object from penetrating said electrical wire and contacting said Electrifiable conductor without contacting one of said first and second return conductors.

47. (New) The electrical wire according to claim 43, wherein said first and second insulating layers, contact each other along a longitudinal edge of said electrical wire.

48. (New) The electrical wire according to claim 47, wherein said first and second insulating layers are treated by at least one of a mechanical, chemical and thermal treatment to form a protective longitudinal edge of said electrical wire, said protective edge inhibiting a foreign object from penetrating said electrical wire and contacting said at least one Electrifiable conductor.

49. (New) The electrical wire according to claim 42, further comprising:

an outer insulating layer formed on said first and second return conductors.

50. (New) The electrical wire according to claim 41, wherein a distance between said at least one electrifiable conductor and each of said first and second return conductors is no greater than approximately 0.030 inches.
51. (New) An electrical current delivery system comprising the electrical wire of claim 41.
52. (New) An electrical signal transmission system comprising the electrical wire of claim 41.
53. (New) The electrical wire according to claim 41, wherein each of said first and second return conductors substantially surround a periphery of said at least one electrifiable conductor.
54. (New) The electrical wire according to claim 41, wherein said electrifiable conductor comprises a power delivery conductor for delivering electrical current to a load.
55. (New) The electrical wire according to claim 54, wherein at least one of said return conductors comprises a conductor for carrying a current away from said load.
56. (New) The electrical wire according to claim 41, wherein said electrical wire comprises AC electrical wire for delivering AC electrical power.
57. (New) The electrical wire according to claim 41, wherein said electrical wire comprises one of 120V AC electrical wire and 240V AC electrical wire.
58. (New) The electrical wire according to claim 41, wherein said at least one electrifiable conductor comprises a cross-sectional area which is substantially equal to a cross-sectional area of at least one of said first and second return conductors.
59. (New) The electrical wire according to claim 41, wherein said electrifiable conductor comprises a thickness which is in a range from about 0.0004 inches to about 0.020 inches.

60. (New) The electrical wire according to claim 42, wherein said first and second return conductors are treated by at least one of a mechanical, chemical and thermal treatment to form a protective longitudinal edge of said electrical wire, said protective edge inhibiting a foreign object from penetrating said electrical wire and contacting said Electrifiable conductor without contacting one of said first and second return conductors.

61. (New) The electrical wire according to claim 42, wherein an area between said first and second return conductors forms a hot zone, said at least one electrifiable conductor being disposed within said hot zone.

62. (New) The electrical wire according to claim 61, wherein said at least one Electrifiable conductor comprises a plurality of Electrifiable conductors which are formed in said hot zone and comprise a plurality of horizontal segments across a width of said wire and a plurality of vertical segments across a thickness of said wire.

63. (New) The electrical wire according to claim 62, wherein at least one segment in said plurality of horizontal segments of said Electrifiable conductors is used to transmit a communication signal, and
wherein at least one segment in said plurality of horizontal segments of said Electrifiable conductors is used to supply one of AC and DC electrical power.

64. (New) The electrical wire according to claim 63, wherein said communication signal comprises one of a voice communication signal and a data communication signal.

65. (New) The electrical wire according to claim 42, wherein a capacitance formed between said at least one Electrifiable conductor and said first and second return conductors is given as $C=1.5 \cdot W \cdot L \cdot \epsilon / d$, where W is the width of the return and electrifiable conductors, L is the length of the return and electrifiable conductors, ϵ is the dielectric constant for the first and second insulating layers, and d is the distance between each of the return and electrifiable conductors.

66. (New) The electrical wire according to claim 42, further comprising:
an adhesive for bonding adjacent insulation layers and conductors in said electrical wire.
67. (New) The electrical wire according to claim 42, wherein an object penetrating an outer surface of said electrical wire contacts one of said first and second grounding conductors and one of said first and second return conductors, before contacting said at least one Electrifiable conductor.
68. (New) The electrical wire according to claim 42, wherein said first and second grounding conductors inhibit power transmission signals and load-generated electrical noise from being emitted from said electrical wire.
69. (New) The electrical wire according to claim 42, wherein said first and second return conductors and said first and second grounding conductors comprise a rate of heat dissipation which is greater than a rate of heat dissipation for an round conductor, for a given cross-sectional area.
70. (New) The electrical wire according to claim 42, wherein said electrical wire comprises one of alternating current (AC) electrical wire and direct current (DC) electrical wire for supplying an electrical current having potential of greater than 0V.
71. (New) The electrical wire according to claim 42, wherein said electrical wire comprises surface-mountable electrical wire.
72. (New) The electrical wire according to claim 42, wherein said first and second return conductors each have a thickness T_G , and said first and second grounding conductors each have a thickness T_N , and said Electrifiable conductor has a thickness T_H , such that a ratio of thicknesses $R=(T_G+T_N)/T_H$ is at least 1.00.

73. (New) The electrical wire according to claim 42, wherein a distance between said at least one electrifiable conductor and each of said first and second return conductors is no greater than approximately 0.030 inches.

74. (New) The electrical wire according to claim 1, wherein a total thickness of the electrical wire is no more than approximately 0.050 inches.

75. (New) The electrical wire according to claim 10, wherein a total thickness of the electrical wire is no more than approximately 0.050 inches.